

**FIFTH ANNUAL REPORT**  
**OF THE**  
**FIRE PREVENTION COMMISSIONER**  
**FOR THE METROPOLITAN DISTRICT**  
**MASSACHUSETTS**

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**FROM AUGUST 1, 1918, TO AUGUST 1, 1919**



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## CONTENTS.

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	PAGE
Results of Fire Prevention during 1918, . . . . .	7-10
Prevention and Limitation of Fires, . . . . .	11
Control of Explosives in 1918, . . . . .	11
Fireworks, . . . . .	11
Water-front Conditions in Boston, . . . . .	12
Garages, . . . . .	12
Engineering Division, . . . . .	12, 13
Smoking in Warehouses, . . . . .	13
Hazards outside the Control of the Commissioner, . . . . .	13, 14
Legislation recommended, . . . . .	14-18
Future of Fire Prevention, . . . . .	19
Five Years of Fire Prevention in Massachusetts, . . . . .	20-29
Educational Work, . . . . .	20, 21
Constructional Work, . . . . .	21, 22
Approval of Plans and Construction, . . . . .	22
Removal or Protection of Hazardous Occupancies, . . . . .	22, 23
Portable Extinguishers, . . . . .	23
Maintenance, . . . . .	23, 24
Paint Stores or Shops in Dwellings, . . . . .	24
Salamanders, . . . . .	24
Egress, . . . . .	24, 25
Fire Protection in Stables, . . . . .	25
Chimney Flues and Vent Pipes, . . . . .	25
Smoking in Factories, etc., . . . . .	25, 26
Signs and Advertising Devices, . . . . .	26
Statistics, . . . . .	26-28
Administration, . . . . .	28, 29



## The Commonwealth of Massachusetts

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TO HIS EXCELLENCY CALVIN COOLIDGE, *Governor of the Commonwealth of Massachusetts.*

SIR:—The Fire Prevention Commissioner for the Metropolitan District herewith submits his fifth annual report.

Very respectfully,

FRANK LEWIS,  
*Fire Prevention Commissioner  
for the Metropolitan District.*

AUG. 1, 1919.



# FIRE PREVENTION COMMISSIONER FOR THE METROPOLITAN DISTRICT.

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## FIFTH ANNUAL REPORT.

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### RESULTS OF FIRE PREVENTION DURING 1918.

The general fire prevention work for the year has progressed along the lines which past experience has shown to be most effective. The results of the work are shown by the continued reduction in the number of fires with losses, the number of alarms, and the smaller comparative losses.

The accompanying tables show the reductions referred to above. In comparing the losses involved from year to year, it is necessary to consider the fluctuation of property values. The value of buildings as well as contents for the year 1918 was from 50 to 100 per cent. higher than in the preceding years. Since all losses are adjusted on the value at the time of the fire, fewer fires of lesser intensity will at the time of high prices produce as great or greater losses than the larger, more serious and more numerous fires would produce during normal prices.

In 1918 there were 44 fires in Boston where the loss exceeded \$10,000 each, with a total loss of \$1,976,000, as compared with 53 in 1917 with a loss of \$3,117,000, 38 in 1916 with a loss of \$1,364,000, and 47 in 1915 with a loss of \$1,787,000.

Although there was a decided increase in the number of alarms in the Metropolitan District in 1918 over 1916 and 1917, yet the number of fires where loss occurred was the smallest it has been for many years. By referring to the table, it will be

## FIRE PREVENTION.

[Aug.]

*Losses and Per Capita Losses in the Metropolitan District for 1914, 1915, 1916, 1917 and 1918.*

	Loss for 1914.	Per Capita Loss for 1914.	Loss for 1915.	Per Capita Loss for 1915.	Loss for 1916.	Per Capita Loss for 1916.	Loss for 1917.	Per Capita Loss for 1917.	Loss for 1918.	Per Capita Loss for 1918.
Arlington,	\$32,200	\$2 27	\$11,400	\$0 77	\$12,600	\$0 61	\$46,700	\$2 82	\$14,000	\$0 82
Belmont,	26,000	3 42	27,400	3 40	2,200	25	53,100	5 84	16,000	1 67
Boston,	3,044,600	4 16	3,003,200	4 03	2,473,000	3 25	4,056,400	5 23	2,827,300	3 58
Brookline,	45,600	1 41	21,000	63	6,700	19	23,600	66	31,500	85
Cambridge,	201,400	1 86	207,200	1 90	330,300	3 00	299,500	2 70	524,600	4 71
Chelsea,	153,400	3 73	132,500	3 05	154,500	3 39	87,300	1 83	148,700	2 97
Everett,	67,200	1 82	68,200	1 81	23,600	61	68,600	1 74	31,400	78
Lexington,	26,700	4 65	12,100	2 18	19,200	3 36	2,600	45	21,600	3 60
Lynn,	445,400	4 71	185,700	1 93	119,900	1 23	174,600	1 77	153,700	1 54
Malden,	89,300	1 86	219,700	4 49	47,700	96	63,600	1 25	35,000	68
Medford,	100,600	3 47	91,200	2 99	31,100	97	32,100	96	89,600	2 56
Melrose,	27,300	1 64	15,600	92	8,400	49	39,900	2 29	19,300	1 11
Milton,	29,800	3 51	20,300	2 36	6,600	76	6,600	74	6,400	71
Newton,	65,700	1 51	112,300	2 50	41,300	94	63,200	1 42	79,000	1 75
Quincy,	74,000	1 89	80,600	1 98	63,100	1 49	81,200	1 85	15,900	35
Reading,	4,900	85	10,900	1 60	56,100	7 20	16,900	1 92	6,400	65
Revere,	51,000	2 14	38,400	1 53	59,000	2 22	28,200	1 01	291,500	9 92
Rockland,	104,900	15 00	12,900	1 82	21,300	3 00	2,100	30	20,100	2 80
Saugus,	43,500	4 63	16,400	1 61	4,300	39	22,300	1 89	21,000	1 67
Somerville,	225,800	2 66	72,600	84	112,500	1 26	112,500	1 24	471,400	5 09
Stoneham,	35,600	4 81	6,900	92	3,200	42	36,600	4 82	13,600	1 77
Waltham,	20,800	70	60,800	2 02	35,600	1 16	32,800	1 05	38,700	1 23
Watertown,	27,100	1 72	21,600	1 31	27,700	1 61	44,700	2 56	27,300	1 46
Winchester,	6,900	88	8,800	88	4,900	48	30,400	2 95	12,100	1 16
Winthrop,	17,100	1 40	30,700	2 41	76,300	5 73	13,200	96	3,800	27
Woburn,	96,900	5 97	311,500	18 90	168,500	10 10	54,300	3 21	43,300	2 53
Metropolitan District,	\$5,063,700	\$3 42	\$4,799,900	\$3 17	\$3,909,100	\$2 53	\$5,493,000	\$3 47	\$4,963,400	\$3 05
Massachusetts outside of Metropolitan District,	\$21,130,600	-	\$4,894,000	\$2 24	\$5,870,000	\$2 65	\$6,172,000	\$2 75	\$7,025,000	\$3 18
Metropolitan District outside of Boston,	\$2,019,100	\$2 70	\$1,797,000	\$2 35	\$1,436,100	\$1 83	\$1,436,600	\$1 78	\$2,136,100	\$2 57



noted that the number of such fires has decreased gradually from 4,169, in 1914, to 3,099, in 1918, a very remarkable and significant result. Outside the Metropolitan District there was a reduction from 4,260, in 1914, to 3,715, in 1918, a reduction of 12.8 per cent as compared with 25.7 per cent in the Metropolitan District.

Aside from the large increases in loss due to big fires in Cambridge and Somerville, the losses in the Metropolitan District compare favorably with the reduced losses of recent years.

*Total Alarms.*

	1915.	1916.	1917.	1918.
Arlington, . . . . .	107	96	125	187
Belmont, . . . . .	53	42	53	90
Boston, . . . . .	5,542	4,572	4,785	5,174
Brookline, . . . . .	312	261	291	350
Cambridge, . . . . .	709	696	699	712
Chelsea, . . . . .	533	502	414	455
Everett, . . . . .	291	243	286	347
Lexington, . . . . .	140	77	93	126
Lynn, . . . . .	1,061	915	1,016	1,022
Malden, . . . . .	399	274	314	327
Medford, . . . . .	422	260	325	391
Melrose, . . . . .	203	119	179	200
Milton, . . . . .	148	122	167	187
Newton, . . . . .	747	460	542	725
Quincy, . . . . .	493	221	378	498
Reading, . . . . .	125	101	95	89
Revere, . . . . .	302	264	270	366
Rockland, . . . . .	44	44	37	86
Saugus, . . . . .	105	87	109	123
Somerville, . . . . .	633	476	410	674
Stoneham, . . . . .	55	37	63	76
Waltham, . . . . .	299	202	281	325
Watertown, . . . . .	148	138	123	202
Winchester, . . . . .	117	115	96	119
Winthrop, . . . . .	155	90	118	120
Woburn, . . . . .	172	154	167	209
Total, . . . . .	13,315	10,568	11,436	13,180

*Number of Fires causing Losses, excluding Alarms where no Loss followed.*

	1914.	1915.	1916.	1917.	1918.
Arlington, . . . . .	35	23	18	33	29
Belmont, . . . . .	9	13	10	15	16
Boston, . . . . .	2,301	2,229	1,855	1,936	1,760
Brookline, . . . . .	37	42	45	48	41
Cambridge, . . . . .	264	262	226	225	169
Chelsea, . . . . .	258	263	180	155	159
Everett, . . . . .	61	64	44	46	55
Lexington, . . . . .	10	14	8	3	12
Lynn, . . . . .	319	242	193	210	171
Malden, . . . . .	152	139	103	74	60
Medford, . . . . .	63	57	52	67	64
Melrose, . . . . .	40	25	19	33	26
Milton, . . . . .	16	13	14	22	16
Newton, . . . . .	110	113	87	94	91
Quincy, . . . . .	84	85	44	48	50
Reading, . . . . .	13	14	16	13	11
Revere, . . . . .	68	66	59	92	81
Rockland, . . . . .	14	10	11	8	18
Saugus, . . . . .	25	29	14	19	30
Somerville, . . . . .	109	122	109	104	90
Stoneham, . . . . .	26	21	18	21	11
Waltham, . . . . .	47	61	50	63	56
Watertown, . . . . .	31	29	36	17	24
Winchester, . . . . .	27	20	21	14	12
Winthrop, . . . . .	25	33	18	24	22
Woburn, . . . . .	25	36	38	28	25
Totals, Metropolitan District.	4,169	4,025	3,288	3,412	3,099
Totals, Massachusetts outside of Metropolitan District.	4,260	4,005	3,813	3,781	3,715

Even with these increases the per capita loss for the Metropolitan District was not as great as in 1914, 1915 or 1917, while outside the Metropolitan District the per capita loss was larger than any of the four years shown in the table. The general trend of the losses is evident from an examination of the per capita losses for each city and town for the past five years.

### PREVENTION AND LIMITATIONS OF FIRES.

For over a year the work of the Fire Prevention Commissioner has been seriously hampered by the great increase in the cost of materials and equipment. At such high prices, only the minimum requirements can be considered, thus lowering the general character of the structures. Changes in existing buildings which represent very definite fire hazards can be obtained only in a few instances because of the limitations of the Commissioner's powers to order changes involving more than 5 per cent of the assessed valuation or to exercise any jurisdiction whatsoever by reason of the particular kind of occupancy.

During the past year 30 orders were issued for automatic sprinklers in buildings, with a result that 8 buildings have been equipped throughout and 4 buildings partially protected. There are pending 13 orders for complete and 5 orders for partial systems.

### CONTROL OF EXPLOSIVES IN 1918.

The handling and use of explosives during the past year have been without accident, and the storage under guards has prevented the theft of them for illegal purposes. This spring the guard service has been discontinued for some of the better type magazines where suitable locks have been provided. The same care has been exercised by the local officials and the explosive dealers to see that explosives were delivered for legitimate purposes only.

### FIREWORKS.

As there seemed to be the general belief among the local authorities that such fireworks and firecrackers as are permitted by law and the regulations should be allowed to be discharged this year on the 17th of June and the 4th of July, the war restrictions were removed. Although there were a number of small fires and accidents, some of which were fatal, yet the results were comparable with the safe and sane Fourth of recent years. Authority is specifically given each city and town to prohibit by ordinance or by-law the sale and use of fireworks and firecrackers, but no such ordinance or by-law has been adopted.

## WATER-FRONT CONDITIONS IN BOSTON.

No explosives which are not under the control of the United States government are allowed to be transported through the city of Boston nor stored within the city unless for use therein. Inflammable fluids are used pretty generally by the boats and vessels in the harbor and about the docks without regulation, except that deliveries are made to them only from authorized stations, which are isolated.

A license was issued recently for the installation of an approved supply station, to be located on the breakwater near the fish pier. Such a station will greatly reduce the hazard from that of the supply boats anchored in the vicinity, as the storage will be buried underground on the shore.

## GARAGES.

This summer, after four years' trial, the regulations on garages adopted in 1915 have been revised to make them consistent with modern construction and the new methods of conducting the business. They are now in a simplified form and represent minimum requirements consistent with the safety of the adjoining property.

Most of the existing garages which represented serious fire and even conflagration hazards have been properly safeguarded, and it is expected that all such garages will be in reasonably good condition by the end of this year.

## ENGINEERING DIVISION.

Last fall the necessity of approving plans and layouts for public garages, dry cleansing establishments, fuel oil installations, oil storage plants and many allied industries was so urgent that an engineer was engaged with the approval of the Governor and Council, and since that time this work has been so important and so great that a second engineer has been employed a large part of the time to handle the special problems which are continually arising.

This department has proved to be one of great service since it provides for the approval once and for all of each proposition,

thus saving much time and expense from alterations which would otherwise have to be made after a plant had been completed.

The department was very fortunate in obtaining the services of Mr. Carl Stuetzel, Jr., formerly supervisor of plans with the Boston Building Department, as an engineer. Mr. Stuetzel has done very efficient work for the department since his engagement last fall.

In October last Mr. Harry E. Lake, who had devoted his entire time and energy as secretary and engineer to the department from the time of its organization in 1914, resigned in order to be of greater assistance to the government during the war, and became associated with the National Board of Fire Underwriters by whom he was assigned to the Bureau of Yards and Docks, Navy Department, Washington, D. C., as an advisory engineer on fire protection. Since Mr. Lake completed his duties at Washington he has been engaged on special engineering work for the department.

To fill the position of secretary made vacant by Mr. Lake's resignation, Mr. Everett W. Shumway was appointed Oct. 7, 1918.

#### SMOKING IN WAREHOUSES.

Since the adoption of the regulation on smoking in warehouses, no fire from this cause has been reported in such a building. Although this was a war measure, yet, up to the present time, no request has been received to discontinue the regulation.

#### HAZARDS OUTSIDE THE CONTROL OF THE COMMISSIONER.

In the last annual report, certain perfecting amendments to the fire prevention statute were recommended, but negative action was taken by the Legislature. It is to be hoped that the coming year will see these extremely important amendments adopted in order that the Commissioner may exercise the authority anticipated by the fire prevention statute.

From Jan. 1, 1918, to Jan. 1, 1919, taking into account fires in the city of Boston where the loss was \$10,000 or more, a loss of \$380,000 occurred in buildings within the jurisdiction of the Commissioner; a loss of \$1,300,000 occurred in buildings



not within his control; and in buildings where his authority is limited by the provision that four or more persons must live or be employed above the second floor, the loss in such fires amounted to \$820,000.

#### LEGISLATION RECOMMENDED.

Below is given a copy of Senate Bill No. 154 of 1919, which should be enacted the coming year. The necessity of such perfecting amendments is stated on pages 16-19 of the fourth annual report of this department.

#### AN ACT RELATIVE TO THE BETTER PREVENTION OF FIRES THROUGHOUT THE METROPOLITAN DISTRICT.

*Be it enacted, etc., as follows:*

SECTION 1. Section seven of chapter seven hundred and ninety-five of the acts of nineteen hundred and fourteen is hereby amended by inserting the words:— or buildings or structures thereon,— after the word “lot”, in the second line,— so as to read as follows:— *Section 7.* No part of any building used for habitation, nor that part of any lot or buildings or structures thereon within fifty feet of any building so used, shall be used for the storage, keeping or handling of any combustible article for other than domestic purposes, or of any article or material that may be dangerous to the public safety as a fire menace, unless a permit has first been obtained therefor from the commissioner. No part of any such building shall be used as a carpenter’s shop nor for the storage, keeping or handling of feed, hay, straw, excelsior, shavings, sawdust, cotton, paper stock, feathers, or rags, except under such terms and conditions as the commissioner may prescribe.

SECTION 2. Section twenty-seven of chapter seven hundred and ninety-five of the acts of nineteen hundred and fourteen is hereby amended by inserting after the word “act”, in the second line, the words:— or any rules or regulations made hereunder,— so as to read as follows:— *Section 27.* — Except as is otherwise hereinbefore provided, any person violating any provision of this act, or any rules or regulations made hereunder, shall be guilty of a misdemeanor and liable to a fine of fifty dollars for each offence, or, in case of a continuing offence after a notice of such violation, to a fine not exceeding ten dollars for every day during which the violation continues.

SECTION 3. Section ten of chapter seven hundred and ninety-five of the acts of nineteen hundred and fourteen is hereby amended by striking out after the word “or”, in the third line, the words “for the business of”, and inserting in place thereof the words:— “tailoring, or any such building within which persons are engaged in”,— and by striking out after the

word "sprinklers", in the sixteenth line, the words "that no such order shall apply to any building unless four or more persons live or are usually employed therein above the second floor", — so as to read as follows: —

*Section 10.* Any building within the metropolitan district used in whole or in part for the purpose of woodworking or tailoring, or any such building within which persons are engaged in manufacturing or working upon wooden, basket, rattan, or cane goods or articles, or tow, shavings, excelsior, oakum, rope, twine, string, thread, bagging, paper, paper stock, cardboard, rags, cotton or linen garments or goods, or rubber, feathers, paint, grease, soap, oil, varnish, petroleum, gasoline, kerosene, benzine, naphtha, or other inflammable fluids, and any buildings in the metropolitan district used in whole or in part for the business of keeping or storing any of such goods or articles, except in such small quantities as are usual for domestic use, or for use in connection with and as incident to some business other than such keeping or storing, shall, upon the order of the commissioner, be equipped with automatic sprinklers.

SECTION 4. Section one of chapter two hundred and eighty of the acts of nineteen hundred and five, as amended, is hereby further amended by inserting after the word "inflammable", in the eleventh line, the words: — gases or, — and by inserting after the word "compounds", in the twelfth line, the words: — or other gases, fluids, or compounds, which may become dangerous to the public safety as a fire or explosion menace, — so as to read as follows: — *Section 1.* The powers and duties heretofore conferred and imposed upon cities and towns and the mayors and aldermen, city councils and selectmen thereof, by chapter one hundred and two of the Revised Laws, to regulate the keeping, storage, use, manufacture, sale, handling, transportation or other disposition of gunpowder, dynamite, crude petroleum or any of its products, or explosive or inflammable gases, or fluids or compounds, or other gases, fluids or compounds, which may become dangerous to the public safety as a fire or explosion menace; tablets, torpedoes, or any explosives of a like nature, or any other explosives, except fireworks and fire crackers, are hereby conferred and imposed upon the detective and fire inspection department of the district police, except as to the transportation of said explosives by steam railroads.

SECTION 5. The fire prevention commissioner for the metropolitan district, immediately upon being informed by report or otherwise that a building or other structure or anything attached or connected therewith in any city or town is specially unsafe in case of fire, may inspect the same; and if it appears to him to be specially unsafe in case of fire, he shall first in writing notify the owner or agent or any person having an interest therein to remove it or make it safe in case of fire. The fire prevention commissioner for the metropolitan district may affix in a conspicuous place upon the exterior walls of the building a notice of its unsafe condition, which notice shall not be removed or defaced without authority from him. Whoever is so notified shall be allowed until twelve o'clock

noon on the day following the service of the notice in which to begin the work of making such building safe in case of fire or of removing such structure, and he shall employ sufficient labor speedily to make it safe or remove it; and such owner or interested person shall for every day's continuance of refusal or neglect to make said building safe or to remove the same, after being so notified, forfeit to the city or town in which the structure is located not less than ten dollars nor more than fifty dollars.

SECTION 6. Section thirteen of chapter seven hundred and ninety-five of the acts of the year nineteen hundred and fourteen is hereby amended by inserting after the letter "H", in the thirty-third line, the words:— Regulating the method of construction of chimneys, the installation of heating plants, and, — and by adding after the forty-seventh line the following new paragraphs:— N. Requiring the installation of automatic sprinklers in such buildings as may be located at the boundaries of fire zones or districts, which said boundaries shall be determined by the commissioner after consultation with the mayors and the heads of fire departments of cities and boards of selectmen and the heads of fire departments of towns. O. Designating the location of unpierced fire walls. P. Requiring the installation of fire windows, constructed with metal or metal covered sashes and frames with wired glass, — so as to read as follows:— *Section 13.* In addition to the powers given by sections one to twelve, inclusive, the commissioner shall have power to make orders and rules relating to fires, fire protection and fire hazard binding throughout the metropolitan district, or any part of it, or binding upon any person or class of persons within said district, limited, however, to the following subjects:—

A. Requiring the keeping of portable fire extinguishers, buckets of water or other portable fire extinguishing devices on any premises by the occupant thereof, and prescribing the number and situation of such devices.

B. Prohibiting or regulating the accumulation, and requiring the removal, of combustible rubbish, including waste paper, cardboard, string, packing material, sawdust, shavings, sticks, rags, waste leather and rubber, boxes, barrels, broken furniture and other similar light or combustible refuse.

C. Prohibiting or regulating the setting or burning of fires out of doors.

D. Causing obstacles that may interfere with the means of exit to be removed from floors, halls, stairways and fire escapes.

E. Ordering the remedying of any condition found to exist in or about any building or other premises, or any ship or vessel in violation of any law, ordinance, by-law, rule or order in respect to fires and the prevention of fire.

F. Causing any vessel moored to or anchored near any dock or pier to be removed and secured in some designated place: *provided*, that such vessel is on fire or in danger of catching fire, or is by reason of its condition or the nature of its cargo a menace to shipping or other property.



G. Requiring and regulating fire drills in theatres, public places of amusement, and public and private schools.

H. Regulating the method of construction of chimneys, the installation of heating plants, and requiring the cleaning of chimney flues and vent pipes.

I. Requiring proper safeguards to be placed and maintained about or over roof skylights.

J. Prohibiting or regulating smoking in factories, workshops and mercantile establishments.

K. Requiring that all signs and advertising devices erected on buildings shall be approved by said commissioner.

L. Causing to be made public all violations of fire prevention laws by posting placards on buildings or premises, and by publishing in the daily newspapers the names of the owners and specifying the buildings in which the violation occurs.

M. Defining the classes of buildings to be equipped with sprinkler protection under the authority of this act.

N. Requiring the installment of automatic sprinklers in such buildings as may be located at the boundaries of fire zones or districts, which said boundaries shall be determined by the commissioner after consultation with the mayors and the heads of fire departments of cities and boards of selectmen and the heads of fire departments of towns.

O. Designating the location of unpierced fire walls.

P. Requiring the installation of fire windows, constructed with metal or metal covered sashes and frames with wired glass.

SECTION 7. Section twenty-two of chapter seven hundred and ninety-five of the acts of nineteen hundred and fourteen is hereby amended by striking out the words "in such cases", in the seventh and eighth lines, and inserting in place thereof the words: — in all cases where such rules or orders require the making of additions to or changes in the premises themselves, such as would immediately become real estate and be the property of the owner of the premises, — so as to read as follows: — *Section 22.* In any case where buildings or other premises are owned by one person and occupied by another under lease or otherwise, the orders of the commissioner shall apply to the occupant alone, except where such rules or orders require the making of additions to or changes in the premises themselves, such as would immediately become real estate and be the property of the owner of the premises. In all cases where such rules or orders require the making of additions to or changes in the premises themselves, such as would immediately become real estate and be the property of the owner of the premises, the rules or orders shall affect the owner and not the occupant, and, unless it is otherwise agreed between the owner and the occupant, the occupant whose use of the premises has caused the making of such additions or changes, in addition to his rent or other payments shall, after the addition or changes are made, pay a reasonable per cent. of the cost thereof annually to the owner of the prem-

ises. No rule or order shall be made or enforced which requires an expenditure by the owner or occupant of more than five per cent of the last annual assessed valuation of the land and buildings to which such rule or order relates.

Since the consolidation of the department, to take effect December 1 next, will place the administration of nearly all the powers conferred by chapter 795 of the Acts of 1914 under one State department for the entire State, the other provisions of of the act should be extended to apply also throughout the State.

#### FIRE PREVENTION DAY.

October 9, the anniversary of the Chicago fire of Oct. 9, 1871, has come to be pretty generally observed throughout the country as Fire Prevention Day, but last year, because of the activities of the United States government, November 2 was the day fixed.

For the past three years a day has been set aside in Massachusetts, by proclamation of the Governor, for the purpose of thinking and talking fire prevention. The preparations and results of last year's observance were much more extensive than in previous years.

On the eve of Fire Prevention Day the annual test of the water curtains on the Filene Building, Washington Street, Boston, was made, and following the successful test a banquet was given the fire chiefs of the Metropolitan District and representatives of insurance and allied associations, after which a parade, consisting of the fire chiefs and representatives, fire apparatus, marching clubs and Boy Scouts, assisted by bands and cadet musicians of the parochial schools, was escorted to the National Theatre, where addresses and appropriate films emphasized the significance of fire and accident prevention.

On the afternoon of Fire Prevention Day an impressive and instructive demonstration of fire apparatus was given at Post Office Square by the Boston Fire Department.

It was rather unfortunate, so far as the school work was concerned, that Saturday should have been chosen for the day of observance, but exercises, consisting of talks and demonstra-

tions by members of the fire departments, were held in most of the schools of the Metropolitan District on Friday, November 1.

As in the past, notices were sent to factory managers requesting them to investigate the means of egress and fire hazards in their factories and to remedy any dangerous conditions found to exist. A large number of factory fire cards were distributed throughout the Metropolitan District.

#### FUTURE OF FIRE PREVENTION.

Even with the strenuous opposition to the enforcement of the fire prevention statutes, the work has progressed, and progressed rapidly. Such enforcement has created many hardships on property owners, especially those who had control of the poorer class of property rented for hazardous businesses where the need for fire prevention was greatest.

Much discretion has been shown in the administration of the law in order to prevent the abandonment or liquidation of property which would in many cases have taken away the income from persons dependent upon it or forced the immediate sale at great loss.

Nevertheless much has been accomplished in the five years' trial, which is summarized, in brief, below, as this year will be the last of the fire prevention work under a separate department devoted to the cause and this the last annual report of the Fire Prevention Commissioner. Chapter 350 of the General Acts of 1919, known as "An Act to organize in departments the executive and administrative functions of the Commonwealth," provides that the fire prevention work shall be carried on by a State Fire Marshal, who will be a director under the control of the Commissioner of Public Safety.

Such a consolidation should give an equitable administration of the laws and a more uniform code should result. Certainly fire prevention is an extremely necessary public function, and the results should be manifested in the improved welfare and happiness of the people. The results already obtained would be more generally realized if it were not for the unrest that permeates the whole world, concealing progress and emphasizing the unavoidable evils of good government.

FIVE YEARS OF FIRE PREVENTION IN MASSACHUSETTS, UNDER  
CHAPTER 795 OF THE ACTS OF 1914.

After several years of agitation on the part of public-spirited citizens, the department of the Fire Prevention Commissioner was organized in the fall of 1914. With little co-operation and severe criticism, the department started on a progressive growth, which it has maintained throughout its existence. The results, which could be plainly foreseen by the promoters, were so unapparent during the early stages that the accomplishments have been attained only by constant application on the part of the untiring officials and employees of the department. It is with great pleasure and gratitude that I record the following results of five years of fire prevention in this State.

In 1914 the Metropolitan Fire Prevention Department consisted of twenty-two cities and towns about and including Boston. Since then six towns have accepted the provisions of the act.

From the outset it was evident that the work must be carried on in two divisions, viz., educational and constructional, the former being the more important.

*Educational Work.*

The educational work has been by far the most effective but unfortunately the less evident. It has been conducted along the following lines:—

1. Addresses.
2. Conferences.
3. Publicity: newspapers and circulars.
4. Schools.
5. Special meetings.

Many addresses have been delivered before labor unions, civic and religious societies, lodges, clubs, business meetings, schools and like assemblies, and much information has been spread through such addresses.

Many conferences have been held with representatives of the various trades interested in the particular subject under consideration. The results of such conferences can be appreciated from the following example.



When the garage regulations were prepared, and before they were adopted, a conference was held with representatives of the garage owners at which their suggestions were noted and modifications of the regulations made to meet the valid objections. Afterwards conferences with the fire chiefs and building inspectors were held and the regulations modified to meet the local conditions. It is evident that regulations made in this manner must necessarily be practicable, and that they were is shown by the fact that they were in effect over four years without amendments, except of a very minor character. The same can be said of all regulations adopted by the department.

Through the medium of the newspapers, which have always been public spirited and anxious to spread educational information, and that of circulars and booklets, mailed, posted and distributed by the school children, cautions have been so emphasized that the impressions will last for years to come.

Many circulars and pamphlets have been distributed among the school children as well as teachers, and from time to time special exercises have been held in the schools along fire prevention lines. Much credit is due the superintendents of schools and members of the fire departments for their efforts in teaching fire prevention. From time to time fire drills have been held by representatives of the department, and to meet the requirements systematic drills have been established in nearly all the schools by the principals in charge.

Besides the general conferences, there have been special meetings, such as that held on Fire Prevention Day last year, which have helped to keep up the interest in the subject. As the result of one special meeting, the general conditions and fire protection in all schoolhouses throughout the district have been greatly improved; of another, the ordinances prohibiting the use of the wooden shingles, because of the flying firebrand hazard, were adopted in nearly half of the cities and towns of the district.

#### *Constructional Work.*

At the outset it was imperative that regulations should be adopted at once governing the important industries in which serious fires would probably occur, in order that the local officials, through whom the work of the Fire Prevention Commis-

sioner must be conducted, might be guided in the exercise of their delegated powers.

Regulations were established as follows:—

Out-of-door fires, . . . . .	Nov. 15, 1914
Delivery of gasoline to boats and vessels, . . . . .	Jan. 1, 1915
Revised, . . . . .	March 31, 1916
Signs and advertising devices, . . . . .	Feb. 17, 1915
Motion-picture films, . . . . .	March 5, 1915
Revised, . . . . .	Jan. 15, 1916
Volatile inflammable fluids and garages, . . . . .	April 1, 1915
Revised, . . . . .	July 22, 1915
Minor amendment, garages, . . . . .	April 17, 1916
Minor amendment, garages, . . . . .	Aug. 30, 1916
Definition of fire limits in Revere, . . . . .	Aug. 1, 1917
Revised, garages, . . . . .	June 1, 1919
Fireworks, . . . . .	June 4, 1915
Paints and oils, . . . . .	Nov. 15, 1915
Explosives, . . . . .	May 15, 1916

### *Approval of Plans and Construction.*

Since the establishment of the regulations it was found that there was not the uniformity of application that was expected, and therefore it was necessary to establish an engineering department. This department now passes on all garages with a capacity exceeding four automobiles, outside of Boston; oil storage and fuel oil systems; dry cleansing and dyeing plants; acetylene gas and oxygen plants; motion-picture film exchanges; and, in fact, all factories, warehouses and buildings or structures wherein large quantities of inflammable fluids or compounds are manufactured, stored, kept or used.

Besides the regular propositions coming before the engineering department, there are many special cases on which decisions are given. This department not only passes on the plans, but also approves the work. The question of strength of materials is left with the local building departments.

### *Removal or Protection of Hazardous Occupancies.*

Many hazardous industries were forced to relocate away from congested value districts, so that many conflagration areas have been eliminated. Other such industries have been required to

relocate in better types of buildings or protect their plants with automatic sprinklers.

In the city of Boston there have been 163 buildings equipped throughout and 101 partially equipped with automatic sprinklers upon order of the Commissioner, and there are now pending 45 orders for complete equipments and 21 for partial systems. The total number of buildings in Boston which are protected by systems of automatic sprinklers approved by the Boston Board of Fire Underwriters is 883, of which 264 have been so protected through the efforts of this department.

Between Jan. 1, 1915, and Jan. 1, 1919, there were in the city of Boston 182 fires where the loss exceeded \$10,000 each, with a total loss of \$8,244,000, as compared with a total of 7,780 fires, with a total loss of \$12,359,000, that is,  $2\frac{1}{3}$  per cent. of the fires represented about 67 per cent. of the loss. Between Jan. 1, 1916, and Jan. 1, 1919, the loss from such fires was \$6,457,000. Of this loss, only \$1,550,000 occurred in buildings in which the Commissioner had sprinkler jurisdiction; \$4,570,000 occurred in buildings where he had no jurisdiction by reason of the nature of occupancy, and \$3,370,000 occurred in buildings where there were not four or more persons living or usually employed above the second floor

#### *Portable Extinguishers.*

Many orders have been issued to provide portable extinguishers in buildings where protection from such equipment would be of value. For the protection of many hazardous businesses such equipment is required by the regulations.

#### *Maintenance.*

The accumulation and disposal of rubbish represent the greatest problem in fire prevention. Not only is there lack of care on the part of the owners of buildings in making proper arrangements for the disposal of such material, but there is also lacking the individual responsibility on the part of tenants and employees to use the available equipment in a proper manner, if at all.

An inspection may reveal the existence of materials subject to spontaneous combustion in large quantity in a cellar near a

vertical combustible shaft, so that a fire would mushroom out on each floor of the building. The janitor, if there is one, is told to remove the same. An order is issued on the owner to have the rubbish removed. After three or four days the rubbish is removed and the order complied with. Another inspection is made a week after the first one and the conditions are as bad or worse than before.

In order to overcome the evils of the present system, there should be a fine established for not properly disposing of waste material, which fine would result in the establishment for each building, of a definite plan for the removal of rubbish. Nearly all cities and towns have regular collection days for rubbish, so that all successful plans, if the public collection is to be depended upon, will have to be based on such a schedule. All refuse should be collected at least once a day, oftener if necessary, and placed in proper metal covered containers, baled and the bales stored in a fireproof room, or removed to a safe place outside the building. At night the premises should be left clean and free from all such material unless it is so kept that it cannot cause or increase a fire.

#### *Paint Stores or Shops located in or near Dwellings.*

Under section 6 of the fire prevention statute, regulations were adopted on paint stores and paint shops, and all such premises reported by the local officials have been provided with proper fireproof rooms in which to keep the paints and oils which are in bulk.

#### *Salamanders.*

Section 9 of the statute provides for the safe use of salamanders. After several prosecutions, the number of fires from such a cause has been very materially reduced.

#### *Egress.*

Although provisions for egress from buildings are well taken care of by the local officials, yet many cases of blocked or faulty stairways or fire escapes have been corrected by this department.

Fire drills have been established in most theatres and public



schools and in a majority of private schools. Many fire drills have been called for by members of the department and bad practices eliminated, so that the drills to-day are well standardized.

### *Fire Protection in Stables for Horses and Mules.*

Since the passage of chapter 158, General Acts of 1916, most of the stables where horses and mules were kept above the first floor have been provided with second runway, protected with automatic sprinklers, or abandoned for such use above the first floor.

Of a total of 218 such stables reported by the local officials, 210 are now in compliance with the above-mentioned statute. The loss of life of horses and mules from fire during the past two years was very small and much less than in previous years.

### *Chimney Flues and Vent Pipes.*

Although no authority is given the Commissioner over structural features of chimneys, yet many chimneys have been repaired after causing small fires. The chimneys as constructed to-day do not afford any practical means of determining their condition. All chimneys should be provided with a cleanout at the bottom.

The removal of soot from chimneys and vent pipes is very important, but there are not the facilities at present to see that they are properly attended to. Many chimney fires occur each year, and in all cases the chimneys are cleaned after the fire or required immediately to be cleaned. The examination of chimneys and vent pipes which have no cleanouts by the inspectors is not practicable.

### *Smoking in Factories, Workshops and Mercantile Establishments.*

The question of prohibiting smoking in factories, workshops and mercantile establishments was taken up before representatives of such establishments and before representatives of the labor unions and it was the unanimous opinion that a general prohibition would be the cause of more serious fires than the

general practice of smoking, because employees would smoke in unfrequented places where a fire would gain considerable headway before being detected.

There are, of course, certain businesses where smoking or the use of matches, sparks or open flames would be dangerous, and in such occupancies smoking is prohibited by regulation.

As smoking has become a general habit among all classes of people, the most plausible means of preventing fires from such a cause in an unprotected building having inflammable contents appears to be the setting aside of a suitable room for the purpose; such a room might also be used as a locker and rest room.

### *Signs and Advertising Devices on Buildings.*

Although all new signs and advertising devices on buildings are erected under regulation of this department, yet there has been no attempt to make all existing signs structurally safe. Many signs exist to-day on the roofs of buildings in all stages of deterioration, and occasionally a sign is precipitated by a strong wind to the street because of the failure of the wooden supports. A general periodic inspection should be made of all signs and advertising devices on buildings in order to require them to be kept in proper condition.

### *Statistics.*

From the beginning records of fires have been kept in accordance with sections 19 and 20 of the fire prevention statute. Because of the number of fires and the congested values in Boston, the reports are received from the fire department without values, except the estimated losses, while, outside of Boston, the reports are made with complete figures. The figures for the Boston reports are obtained as far as possible from reports from the insurance companies and the losses finally checked with the figures of the Boston Protective Department, to which department is due full credit for all published statistics on Boston fire losses. The reports for the cities and towns outside of Boston are all checked with the insurance reports and corrected when necessary.

These corrected reports are all on file in the office in card index form as well as the insurance reports. Most of the insurance reports are made by the Actuarial Bureau of the National Board of Fire Underwriters from reports received by that bureau from the adjusters. The companies which do not report to the Actuarial Bureau are supposed to report directly to the department, but complete reports are not received because of the number of foreign and other companies with headquarters outside of the State from which the difficulties of obtaining the reports is very great.

The Actuarial Bureau is doing excellent work in collecting statistics on fire losses, and the reports from the bureau have been very satisfactory.

From the reports a card index is kept of the owners of property and occupants on whose premises fires occur, so that the number of fires and losses of an owner or occupant are available.

All statistics quoted in the annual reports of the department have been taken from the reports of the District Police in order that the comparisons would be made on the same basis. There are numerous losses which are adjusted by the insurance companies which are not reported to the District Police and of which no record is made in their reports either as to number of fires or as to losses. In comparing the causes of fires, all fires should be considered, so that the statistics will fairly represent the conditions as they exist. Although the loss involved in such fires does not represent a large per cent of the total loss, yet the number of fires would have a big influence on the causes, unless it could be assumed that the same ratio exists between the causes of such fires and those for which the statistics are now given, which undoubtedly would not be the case. In 1918 there were reported in Boston 1,585 such fires, representing a total loss of \$83,000. The total number of fires not including this type of fires in Boston for 1918 was 1,760, and the total loss exclusive of that for such fires was \$2,830,000, so that there were not recorded in 1918 47 per cent of the number of fires with loss and  $3\frac{1}{2}$  per cent of the loss due to such fires.

The tabulations given in Appendices IV and V have been made from published records, and are extremely interesting and instructive. They show averages taken over a period of years, for both the occupancies and the causes of fires. The percentages and average per fire indicate in general how effective fire prevention should be conducted.

Statistics are of great value if properly interpreted and misleading unless thoroughly understood. The utmost care should be used in quoting from tables.

### *Administration.*

It was recognized from the beginning that the fire prevention work must be administered fairly to all without regard to political or friendly influence, and that has been the continued policy of the department. All decisions have been rendered free from prejudice and influence and according to the best judgment of the Commissioner, taking into consideration all the facts in the case.

Sections 4 and 19 of the fire prevention statute place a great deal of responsibility and work upon the local departments, without providing a means of performing such duty. All of the fire departments are limited to the minimum number of men, who are required to be at their stations ready for alarms, and, therefore, the investigations must be done by the officers of the departments, who are already overtaxed with duties and responsibilities. For five years the Commissioner has endeavored to obtain through the Legislature permission to employ inspectors or investigators to work in co-operation with the local officials, but such authority has been denied with the suggestion that the present system should be given a fair trial. Certainly a fair trial has been given, and it is the opinion of the local officials as well as of the Commissioner that for the Metropolitan District there should be at least six men trained in particular branches of the work in order to satisfactorily and efficiently carry out the functions of the department.

The local officials, and especially the members of the fire and building departments, have performed willingly and with great credit to themselves the additional duties required of them by the Commissioner. Without their assistance the department

would have been of very little value to the people. However, without the department of fire prevention there would not be the co-operation between the local departments nor the uniformity of administration and enforcement of the law that now exists.

There can be little doubt but that the Department of Public Safety, which will succeed in the exercise of the powers and obligations of the department, will be better equipped and will receive better support from the public, so that even greater results can be expected within the next few years along fire prevention lines.



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## APPENDICES.

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## APPENDIX I.

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### CITIES AND TOWNS IN THE METROPOLITAN FIRE PREVENTION DISTRICT.

The following is a list of the cities and towns included in the Metropolitan Fire Prevention District, with the population according to the census of 1915:—

<i>Cities.</i>	
Boston, . . . . .	745,439
Cambridge, . . . . .	108,822
Chelsea, . . . . .	43,426
Everett, . . . . .	37,718
Lynn, . . . . .	95,803
Malden, . . . . .	48,907
Medford, . . . . .	30,509
Melrose, . . . . .	16,880
Newton, . . . . .	43,113
Quincy, . . . . .	40,674
Revere, . . . . .	25,178
Somerville, . . . . .	86,854
Waltham, . . . . .	30,154
Woburn, . . . . .	16,410
	1,369,887
<i>Towns.</i>	
Arlington, . . . . .	14,889
Belmont, . . . . .	8,081
Brookline, . . . . .	33,490
Lexington, . . . . .	5,538
Milton, . . . . .	8,600
Reading, . . . . .	6,805
Rockland, . . . . .	7,074
Saugus, . . . . .	10,226
Stoneham, . . . . .	7,489
Watertown, . . . . .	16,515
Williamstown, . . . . .	3,981
Wilmington, . . . . .	2,330
Winchester, . . . . .	10,005
Winthrop, . . . . .	12,758
	147,781
Total population, . . . . .	1,517,668

## APPENDIX II.

### MEMBERS OF THE FIRE PREVENTION DEPARTMENT IN THE METROPOLITAN DISTRICT.

#### *Fire Prevention Department for the Metropolitan District.*

Commissioner, . . . . .	Frank Lewis.
Deputy Commissioner, . . . . .	Michael A. Murphy.
Secretary, . . . . .	Everett W. Shumway.

#### *Heads of Fire Departments in the Metropolitan District.*

CITY OR TOWN.	Head of Fire Department.	Central Fire Station.
Arlington, . . . . .	Chief Walter H. Peirce, . . . . .	1003 Massachusetts Ave.
Belmont, . . . . .	Chief John F. Leonard, . . . . .	Leonard St.
Boston, . . . . .	Commissioner John R. Murphy, . . . . .	40 Bristol St.
	Chief Peter E. Walsh, . . . . .	Mason St.
	Deputy Chief of 1st Division John O. Taber.	Fort Hill Sq.
	Deputy Chief of 2d Division Daniel F. Sennott.	Winslow and Dudley sts., Roxbury.
	Deputy Chief of 3d Division Henry A. Fox.	Warren Ave.
District 1, . . . . .	F. A. Sweeney, . . . . .	Paris St., East Boston.
District 2, . . . . .	Wm. E. Riley, . . . . .	Main St., Charlestown.
District 3, . . . . .	Capt. J. J. Kane (Acting), . . . . .	Pittsburgh St., South Boston.
District 4, . . . . .	Edw. J. Shallow, . . . . .	Bulfinch St.
District 5, . . . . .	Albert J. Caulfield, . . . . .	Mason St.
District 6, . . . . .	Francis J. Jordan, . . . . .	Dorchester St., South Boston.
District 7, . . . . .	Capt. J. J. Lally (Acting), . . . . .	Warren Ave.
District 8, . . . . .	Wm. J. Gaffey, . . . . .	Tremont St., Roxbury.
District 9, . . . . .	Joseph H. Kenney, . . . . .	Dudley St., Roxbury.
District 10, . . . . .	Walter M. McLean, . . . . .	Harvard St., Dorchester.
District 11, . . . . .	Capt. G. H. Nichols (Acting), . . . . .	Harvard Ave., Allston.
District 12, . . . . .	Michael T. Mulligan, . . . . .	Centre St., Jamaica Plain.
District 13, . . . . .	Michael J. Kennedy, . . . . .	Cor. Washington and Poplar sts., Roslindale.
District 14, . . . . .	A. J. McDonald, . . . . .	Peabody Sq., Dorchester.
District 15, . . . . .	Joseph A. Dolan, . . . . .	Cor. Harvard Ave. and Winthrop St., Hyde Park.

*Heads of Fire Departments in the Metropolitan District — Concluded.*

CITY OR TOWN.	Head of Fire Department.	Central Fire Station.
Brookline, . . .	Commissioner W. W. Estabrook, .	340 Washington St.
	Chief George H. Johnson, . .	340 Washington St.
Cambridge, . . .	Chief James M. Casey, . . .	Inman Sq.
Chelsea, . . . .	Chief David M. Hudson, . . .	307 Chestnut St.
Everett, . . . .	Chief Joseph T. Swan, . . . .	Broadway.
Lexington, . . .	Chief Edward W. Taylor, . . .	5 Main St.
Lynn, . . . . .	Chief Edward E. Chase, . . .	Broad St.
Malden, . . . .	Commissioner John H. Hannan, .	Mountain Ave.
	Chief John T. Nicholls, . . .	388 Main St.
Medford, . . . .	Chief Thomas A. Qualey, . . .	1 South St.
Melrose, . . . .	Chief Joseph Edwards, . . . .	576 Main St.
Milton, . . . . .	Chief J. Harry Holmes, . . . .	Danton Ave.
Newton, . . . . .	Chief W. B. Randlett, . . . .	27 Willow St.
Quincy, . . . . .	Chief Alfred L. Meade, . . . .	Quincy Ave.
Reading, . . . .	Chief O. O. Ordway, . . . . .	11 Pleasant St.
Revere, . . . . .	Chief A. L. Kimball, . . . . .	Broadway.
Rockland, . . . .	Chief Fred Chapman, . . . . .	Union St.
Saugus, . . . . .	Chief George W. Atkinson, . . .	Woodbury Ave.
Somerville, . . .	Chief Sewall M. Rich, . . . . .	261 Medford St.
Stoneham, . . . .	Chief A. J. Smith, . . . . .	1 Tidd St.
Waltham, . . . .	Chief George L. Johnson, . . . .	Moody St.
Watertown, . . .	Chief John W. O'Hearn, . . . .	99 Main St.
Williamstown, . .	Chief A. Remillard, . . . . .	Waters St.
Wilmington, . . .	Chief E. L. Day, . . . . .	Church St.
Winchester, . . .	Chief David H. DeCourcy, . . .	Mt. Vernon St.
Winthrop, . . . .	Chief J. B. Tewksbury, . . . .	31 Pauline St.
Woburn, . . . . .	Chief Frank E. Tracy, . . . . .	Winn St.

### APPENDIX III.

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#### BUILDING COMMISSIONERS AND INSPECTORS IN THE METROPOLITAN DISTRICT.

Arlington, . . . . .	William Gratto.
Belmont, . . . . .	James R. Logan.
Boston, . . . . .	Commissioner Herbert A. Wilson.
Brookline, . . . . .	Commissioner E. Lyon.
Cambridge, . . . . .	Jeremiah Downey.
Chelsea, . . . . .	James C. Denning.
Everett, . . . . .	George H. Wood.
Lexington, . . . . .	William Gratto.
Lynn, . . . . .	Dennis J. Dinneen.
Malden, . . . . .	C. George W. Bagge.
Medford, . . . . .	Frank B. Blodgett.
Melrose, . . . . .	William S. Allen.
Milton, . . . . .	G. E. Burt.
Newton, . . . . .	Commissioner Walter R. Forbush.
Quincy, . . . . .	Warren S. Parker.
Reading, . . . . .	George Sidebottom.
Revere, . . . . .	William H. Graham.
Somerville, . . . . .	Commissioner George L. Dudley.
Stoneham, . . . . .	Albert L. Smith.
Waltham, . . . . .	Arthur L. Cole.
Watertown, . . . . .	William H. Wilson.
Winchester, . . . . .	Maurice Dineen.
Winthrop, . . . . .	F. L. Hodges.
Woburn, . . . . .	Henry Macksey.



NUMBER OF FIRES FOR YEARS 1909 TO 1918, INCLUSIVE, MASSACHUSETTS (NOT INCLUDING BOSTON) AND BOSTON  
— Concluded.

CAUSE.	1909.	1910.	1911.	1912.	1913.	1914.	1915.	1916.	1917.	1918.	Total.	Average.	Per Cent.
Fireworks, . . . . .	86	71	42	45	36	28	11	23	26	31	399	40	.56
Foreign substances in stock, . . . . .	45	26	14	12	2	8	3	1	5	—	116	12	.16
Friction, . . . . .	1	3	—	—	3	51	29	29	23	22	343	34	.48
Gasoline or volatile oils, ignition of, . . . . .	2	31	19	43	44	37	23	73	—	—	14	1	.02
Hot ashes in wooden receptacles, . . . . .	87	104	119	171	176	204	169	156	12	46	424	42	.60
Incendiary, . . . . .	37	29	36	70	68	72	71	74	72	9	66	7	.09
Lamp, lantern or stove taking fire, upset or broken, . . . . .	71	91	94	104	94	144	105	138	66	153	1,504	150	2.12
Lighting fire with kerosene or gasoline, . . . . .	34	24	44	39	38	33	47	33	101	68	591	59	.83
Lightnings, . . . . .	135	111	102	126	137	126	146	134	40	35	1,053	105	1.48
Malicious mischief, . . . . .	16	9	8	20	3	17	29	21	110	65	367	37	.52
Material ignited by gas jet, lamp, stove, etc., . . . . .	221	162	206	203	196	185	173	96	200	217	1,859	186	2.62
Mechanics' torches, . . . . .	77	55	65	60	45	49	70	52	554	38	554	55	.78
Miscellaneous, . . . . .	3	3	2	3	4	1	41	5	1	5	68	7	.10
Overheated cooking or heating apparatus, . . . . .	1	2	—	—	2	—	—	2	3	1	11	1	.02
Rats and matches, . . . . .	42	63	156	78	110	66	9	80	143	104	851	85	1.20
Sparks from bonfires, brush or forest, . . . . .	4	1	1	5	10	3	—	3	13	9	49	5	.07
	37	30	41	60	41	65	54	27	41	52	448	45	.63
	22	10	34	37	11	35	25	15	9	21	219	22	.31
	241	281	272	311	298	366	388	373	289	239	3,057	306	4.30
	174	171	181	206	180	188	152	133	127	121	1,633	163	2.29
	22	11	13	8	35	32	30	12	15	15	198	20	.28
	5	8	4	15	10	5	8	—	11	9	75	7	.11
	38	24	65	68	88	119	127	64	74	106	773	77	1.09
	13	11	23	24	28	40	30	29	25	24	247	25	.35
	198	216	232	271	249	364	295	328	345	340	2,833	283	3.90
	68	71	77	90	77	101	111	92	181	106	875	87	1.23
	126	137	149	150	145	195	107	81	77	58	1,230	123	1.73
	78	81	80	111	83	63	49	44	33	26	706	71	.99
	67	72	115	60	52	83	144	38	88	156	855	85	1.20
	6	13	17	6	11	7	23	3	13	10	109	11	.15



Sparks from chimney,	S.	204	182	224	268	204	239	262	235	219	241	2,278	228	3.20
Sparks from firebox in boiler room,	B.	37	38	66	74	59	54	66	54	55	38	541	54	.76
Sparks from forges, heaters, fireplaces, etc.,	B.	23	18	15	—	9	18	9	10	10	8	129	13	.18
Sparks from locomotives,	B.	4	5	—	—	4	1	—	3	8	1	26	3	.04
Sparks from matches,	B.	108	101	123	93	109	117	101	125	94	89	1,060	106	1.49
Spontaneous combustion,	B.	43	23	30	46	26	31	25	39	32	36	341	34	.48
Thawing water pipes,	B.	95	38	85	64	85	57	70	43	53	65	675	67	.95
Tramps,	B.	17	11	9	18	8	12	9	7	9	14	114	11	.16
Unknown,	B.	96	100	144	111	87	131	104	102	83	65	1,023	102	1.44
Separate totals,	S.	4	2	2	1	1	2	—	5	—	—	17	2	.02
Grand total,	B.	213	226	200	245	259	325	326	331	306	233	2,864	266	3.75
Exposure,	B.	59	81	91	93	84	92	120	98	77	63	858	86	1.21
	B.	34	58	31	164	36	163	19	71	142	187	905	90	1.27
	B.	10	24	12	53	17	56	6	36	63	64	341	34	.48
	B.	14	21	16	10	25	34	34	19	20	17	210	21	.30
	B.	—	—	—	1	—	1	—	—	—	1	3	—	—
	B.	459	489	521	488	527	655	617	540	446	375	5,117	512	7.22
	B.	182	112	199	231	257	269	351	267	241	185	2,294	229	3.24
Separate totals,	S.	4,231	4,221	4,746	5,055	5,149	6,128	5,801	5,246	5,237	5,054	50,888	5,089	71.60
Grand total,	B.	1,868	1,708	2,008	2,375	2,096	2,301	2,229	1,855	1,936	1,760	20,136	2,014	28.40
Exposure,	B.	6,099	5,929	6,754	7,430	7,245	8,429	8,030	7,101	7,193	6,814	71,024	7,102	100.00
	B.	435	405	408	558	686	2,666	531	495	354	453	6,991	—	—

## APPENDIX V.

## AVERAGE FOR YEARS 1907 TO 1918, INCLUSIVE, MASSACHUSETTS (NOT INCLUDING BOSTON) AND BOSTON.

[Statistics on fires compiled from the reports of the Massachusetts District Police. "S" signifies State, exclusive of Boston; "B" signifies Boston.]

OCCUPANCY.	TOTAL.		AVERAGE PER YEAR.		PER CENT.		AVERAGE PER FIRE.		Total Fires (Number).	Average Fires (Number).
	Buildings.	Contents.	Buildings.	Contents.	Buildings.	Contents.	Buildings.	Contents.		
Automobiles, . . . . .	\$246,500	\$148,100	\$20,500	\$12,300	.38	.22	\$280	\$170	885	74
Bakeries, . . . . .	15,200	103,000	1,300	8,600	.02	.16	40	240	425	35
Banks, . . . . .	264,100	157,400	22,000	13,100	.40	.24	750	440	354	30
Barber shops, . . . . .	43,800	48,600	3,600	4,000	.07	.07	390	430	112	9
Barns and stables, . . . . .	81,600	8,900	8,900	6,800	.16	.12	1,140	870	94	8
Blacksmiths, . . . . .	107,300	38,400	1,400	3,200	.02	.06	310	710	54	4
Board and lodging, . . . . .	16,500	53,300	6,600	4,400	.12	.08	350	230	228	19
Bridges, docks and wharves, . . . . .	79,100	32,100	3,400	2,700	.06	.05	250	190	165	14
Buildings under construction and unoccupied, . . . . .	40,700	2,470,800	372,600	203,400	6.84	3.68	1,100	600	4,052	338
Candy manufacturing, . . . . .	4,470,900	435,200	36,300	36,300	.74	.66	950	860	507	42
Carpenter shops, . . . . .	482,500	45,300	4,800	3,800	.09	.07	230	230	251	21
Churches, . . . . .	58,100	36,900	4,300	3,100	.08	.06	690	490	75	6
	51,600	99,000	24,300	8,200	.44	.15	450	150	646	54
	292,200	96,800	12,000	8,000	.22	.14	150	100	969	81
	143,800	2,500	9,100	200	.16	—	3,040	70	36	3
	109,400	2,800	4,600	200	.08	—	1,240	50	45	4
	266,400	17,700	22,200	1,800	.41	.03	1,090	260	244	20
	203,300	21,200	16,900	1,500	.31	.03	2,480	990	82	7
	89,700	127,800	7,500	10,600	.14	.19	700	2,240	129	11
	62,400	123,300	5,200	10,300	.09	.19	1,140	500	55	5
	49,700	42,200	4,100	3,500	.07	.06	150	480	84	7
	35,600	36,200	3,000	2,000	.05	.05	450	480	79	7
	1,467,500	252,300	122,300	21,000	2.25	.38	6,190	1,070	237	20
	240,300	49,100	20,000	4,100	.37	.07	3,390	690	71	6



Cigars and tobacco, . . . . .	S.	33,100	85,400	2,800	7,100	.05	.13	370	950	90	7
Clothing and furnishings, . . . . .	B.	19,100	38,100	1,600	3,200	.03	.35	240	480	80	7
Clothing and furnishings, . . . . .	S.	275,500	896,900	23,000	74,700	.42	1.35	970	3,160	284	24
Clubs and lodges, . . . . .	B.	78,300	346,100	6,500	28,800	.12	.52	580	2,550	136	11
Clubs and lodges, . . . . .	S.	660,000	281,500	55,000	23,500	1.01	.43	1,780	760	371	31
Coal and wood yards, . . . . .	S.	267,800	59,800	22,300	5,000	.41	.09	1,770	397	151	13
Coal and wood yards, . . . . .	B.	220,000	110,600	18,300	9,200	.33	.17	1,720	860	128	11
Cotton mills, . . . . .	B.	170,400	67,200	14,200	5,600	.26	.10	3,710	1,460	46	4
Cotton mills, . . . . .	S.	453,700	644,900	37,800	53,700	.69	.97	490	700	926	77
Cotton mills, . . . . .	B.	1,700	15,300	100	1,300	—	.02	240	220	7	1
Drug stores, . . . . .	S.	142,100	285,300	11,800	23,800	.22	.43	690	1,390	205	17
Drug stores, . . . . .	B.	40,100	104,400	3,300	8,700	.11	.16	370	980	107	9
Dry cleansing and dyeing, . . . . .	S.	72,300	136,800	6,000	11,400	.11	.21	1,230	2,320	59	5
Dry cleansing and dyeing, . . . . .	B.	33,000	45,400	2,700	3,800	.05	.07	1,500	2,060	22	2
Dry and fancy goods, . . . . .	S.	511,200	1,414,400	42,600	117,300	.78	2.13	1,480	3,960	337	30
Dry and fancy goods, . . . . .	B.	197,300	595,000	16,400	49,600	.30	.90	860	2,590	230	19
Dwellings, . . . . .	S.	17,832,600	12,909,900	1,490,200	1,075,800	27.35	19.49	540	390	32,971	2,748
Dwellings, . . . . .	B.	2,905,200	1,472,400	242,100	122,700	4.44	2.22	220	110	13,170	1,097
Factories, unclassified, . . . . .	S.	4,171,600	5,337,500	347,600	446,500	6.38	8.09	2,510	3,230	1,661	138
Factories, unclassified, . . . . .	B.	1,066,000	2,660,700	88,800	221,700	1.63	4.01	1,670	4,170	638	53
Factories, unclassified, . . . . .	S.	224,200	196,300	18,700	16,400	.34	.30	1,170	1,020	192	16
Factories, unclassified, . . . . .	B.	147,900	310,400	12,300	25,900	.23	.47	1,970	4,130	75	6
Fruit, . . . . .	S.	90,000	98,700	7,500	8,200	.14	.15	370	410	242	20
Fruit, . . . . .	B.	42,100	39,400	3,500	3,300	.06	.06	330	310	129	11
Furniture, . . . . .	S.	315,200	480,700	26,300	40,100	.48	.73	1,910	2,920	165	14
Furniture, . . . . .	B.	44,200	179,800	3,700	15,000	.07	.27	530	2,140	84	7
Garages, . . . . .	S.	373,700	823,000	31,100	68,600	.57	1.24	560	1,240	663	55
Garages, . . . . .	B.	286,100	1,006,300	23,800	83,900	.44	1.52	1,820	6,410	157	13
Gas houses, . . . . .	S.	56,800	31,500	4,700	2,600	.09	.05	1,830	1,020	31	3
Gas houses, . . . . .	B.	200	200	—	—	—	—	200	200	1	—
Greenhouses, . . . . .	S.	36,900	21,700	3,100	1,800	.06	.03	530	310	69	6
Greenhouses, . . . . .	B.	4,300	2,000	400	200	.01	—	350	170	12	1
Grocery stores, . . . . .	S.	438,200	683,500	36,500	57,000	.67	1.03	430	670	1,017	85
Grocery stores, . . . . .	B.	212,200	504,600	17,500	42,000	.32	.76	320	750	672	56
Halls, . . . . .	S.	206,500	107,200	23,000	8,900	.32	.16	2,110	1,090	98	8
Halls, . . . . .	B.	275,900	28,100	2,300	2,300	.42	.04	9,510	970	29	2
Hardware, . . . . .	S.	115,800	230,800	9,600	19,200	.18	.35	1,520	3,040	76	6
Hardware, . . . . .	B.	163,400	613,600	13,600	51,100	.25	.93	2,370	8,900	69	6
Henneries, . . . . .	S.	44,800	19,500	3,700	1,600	.07	.03	160	70	273	23
Henneries, . . . . .	B.	4,000	3,100	300	300	.01	.01	100	70	41	3
Hospitals, . . . . .	S.	42,300	19,000	3,500	1,600	.06	.03	690	310	61	5
Hospitals, . . . . .	B.	14,300	2,300	1,200	43,000	.02	—	420	70	34	3
Hotels, . . . . .	S.	1,527,200	515,900	127,300	43,000	2.34	.78	3,300	1,110	463	39
Hotels, . . . . .	B.	301,000	160,700	25,100	13,400	.46	.24	1,370	730	220	18

## AVERAGE FOR YEARS 1907 TO 1918, INCLUSIVE, MASSACHUSETTS (NOT INCLUDING BOSTON) AND BOSTON — Concluded.

OCCUPANCY.	TOTAL.		AVERAGE PER YEAR.		PER CENT.		AVERAGE PER FIRE.		Total Fires (Number).	Average Fires (Number).
	Buildings.	Contents.	Buildings.	Contents.	Buildings.	Contents.	Buildings.	Contents.		
Ice houses, . . . . .	\$714,300	\$361,200	\$59,500	\$30,100	1.09	.54	\$4,440	\$2,240	161	13
Jewelry stores, . . . . .	38,500	90,100	3,200	7,500	.06	.14	840	1,960	46	4
Junk shops, . . . . .	27,400	67,700	2,300	5,600	.04	.10	780	1,930	35	3
Laundries, . . . . .	98,600	97,200	8,200	8,100	.15	.15	920	910	107	9
Leather establishments, . . . . .	26,200	22,400	2,200	1,900	.04	.03	420	360	63	5
Liquor stores, . . . . .	166,100	311,700	13,800	26,000	.25	.47	770	1,460	214	18
Lumber yards, . . . . .	118,600	195,400	9,900	16,300	.18	.29	1,280	2,110	93	8
Machine shops, . . . . .	1,396,200	1,485,900	116,300	123,800	2.14	2.24	7,320	7,780	191	16
Markets, . . . . .	102,800	425,100	8,600	35,400	.16	.64	1,900	7,880	54	4
Millinery, . . . . .	42,500	52,500	3,500	4,400	.06	.08	290	360	146	12
Office buildings, . . . . .	228,100	328,500	19,000	27,400	.35	.50	960	1,380	238	20
Paint and oil stores, . . . . .	326,800	592,200	27,200	49,300	.50	.89	3,060	5,540	107	9
Paper mills and dealers, . . . . .	235,700	512,600	19,600	42,700	.36	.77	6,040	13,200	39	3
Periodicals and stationery, . . . . .	617,200	523,200	51,400	43,600	.94	.79	2,620	2,220	236	20
Photo studios, . . . . .	255,900	814,000	21,300	67,800	.39	1.23	3,460	11,000	74	6
Physicians and dentists, . . . . .	273,600	312,300	22,800	26,000	.42	.47	1,120	1,290	243	20
Plumbers, . . . . .	51,800	148,900	4,300	12,400	.08	.22	320	920	161	13
	57,700	96,000	4,800	8,000	.09	.14	560	940	102	8
	24,200	89,400	2,000	7,400	.04	.13	440	1,620	55	5
	268,000	249,600	22,300	20,800	.41	.38	1,380	1,280	195	16
	349,600	445,100	29,100	37,100	.53	.67	1,890	2,410	185	15
	112,500	167,300	9,400	13,900	.17	.25	700	1,050	160	13
	170,700	307,900	14,200	25,700	.26	.47	1,820	3,280	94	8
	170,800	507,300	14,200	42,300	.26	.77	1,540	4,570	111	9
	6,100	29,500	500	2,500	.01	.04	360	1,740	17	1
	12,100	44,600	1,000	3,700	.02	.07	390	1,440	31	3
	4,800	9,600	400	800	.01	.02	130	260	37	3
	36,400	44,300	3,000	3,700	.05	.07	540	660	67	6
	23,500	16,500	2,000	1,400	.04	.03	940	680	25	2
	7,900	25,000	700	2,100	.01	.04	150	480	52	4
	10,800	9,800	900	800	.02	.02	280	260	38	3
	41,900	42,000	3,500	3,500	.06	.06	510	510	82	7
	12,000	9,800	1,000	800	.02	.02	330	270	36	3

Pool, billiards, bowling,	S.	91,300	86,500	7,600	7,200	.14	.13	700	660	130	11
Printing,	B.	41,000	28,800	3,400	2,400	.06	.04	950	670	43	4
Private schools and academies,	B.	202,400	532,100	16,900	44,300	.31	.80	1,760	4,630	115	10
Public buildings,	B.	127,700	360,800	10,600	30,100	.19	.54	1,120	3,170	114	9
Public schools,	B.	1,174,100	248,100	97,800	20,700	1.80	.37	12,100	2,560	97	8
Railroads,	B.	115,900	8,100	9,700	700	.18	.01	3,310	2,310	35	3
Restaurants,	B.	1,397,800	344,800	116,300	28,700	2.14	.52	3,500	1,360	254	21
Sheds and outbuildings,	B.	122,300	22,200	10,200	1,800	.19	.03	1,680	300	73	6
Shoe factories,	B.	366,100	46,800	30,500	3,900	.56	.07	4,310	550	85	7
Shoe stores,	B.	4,900	600	400	—	.01	—	350	40	14	1
Shoeshouses,	B.	530,500	958,500	44,200	79,900	.81	1.45	1,220	2,200	435	36
Stores and dwellings,	B.	776,300	64,700	66,700	96,100	1.19	1.74	6,020	8,950	129	11
Stores, unclassified,	B.	251,900	149,900	21,000	12,500	.38	.23	590	350	427	36
Summer cottages,	B.	227,000	235,900	18,900	19,700	.35	.36	530	550	150	89
Tailor shops,	B.	246,100	165,000	20,500	13,700	.38	.25	230	230	1,072	31
Theaters,	B.	91,600	86,900	7,600	7,200	.14	.13	240	230	374	32
Unclassified,	B.	614,200	1,351,500	51,200	112,600	.94	2.04	1,580	3,480	388	3
Woolen mills,	B.	55,600	183,300	4,600	15,300	.08	.28	1,630	5,390	34	21
Vessels,	B.	153,800	363,400	12,800	30,300	.23	.55	620	1,430	254	14
Woodworking with power,	B.	107,800	440,500	9,000	36,700	.16	.66	1,000	2,550	173	95
Stores and dwellings,	B.	1,141,700	2,559,400	95,100	213,300	1.75	3.87	1,930	3,600	554	46
Stores, unclassified,	B.	516,600	1,993,400	43,000	166,100	.79	3.01	970	640	677	56
Summer cottages,	B.	657,400	430,100	54,800	35,800	1.01	.65	770	680	167	14
Tailor shops,	B.	128,900	113,100	10,700	9,400	.20	.17	970	1,390	1,548	129
Theaters,	B.	1,500,300	2,142,900	125,000	178,600	2.30	3.24	1,050	2,460	739	62
Unclassified,	B.	777,800	64,800	56,000	152,000	1.19	2.75	1,740	570	387	32
Woodworking with power,	B.	672,400	221,000	—	18,000	1.03	.33	—	—	—	—
Woolen mills,	B.	126,700	183,100	10,600	15,300	.19	.28	360	510	356	30
Vessels,	B.	285,100	367,300	23,800	30,600	.44	.55	980	1,260	291	24
Separate total,	B.	438,000	123,700	36,500	10,300	.67	.19	3,920	1,100	112	9
Grand total,	B.	1,122,000	22,900	9,300	1,900	.17	.03	5,600	1,140	20	2
Unclassified,	B.	1,127,000	734,700	83,900	61,200	1.72	1.11	1,240	1,810	905	75
Woodworking with power,	B.	329,000	497,400	27,400	41,400	.75	.75	480	740	673	56
Woolen mills,	B.	770,500	694,700	64,200	57,900	1.18	1.05	2,760	2,510	277	23
Vessels,	B.	128,000	163,400	10,700	13,600	.20	.25	1,540	1,970	83	7
Separate total,	B.	498,700	344,100	41,600	28,700	.76	.52	3,000	2,070	166	14
Grand total,	B.	43,500	296,500	3,600	24,700	.07	.45	8,700	59,300	5	—
Unclassified,	B.	97,000	64,800	8,100	5,400	.15	.10	1,200	800	81	7
Woodworking with power,	B.	267,100	187,000	22,300	15,600	.41	.28	3,550	2,460	76	6
Woolen mills,	B.	551,833,600	\$45,566,500	\$4,319,500	\$3,797,200	—	—	\$880	\$770	58,804	4,900
Vessels,	B.	13,572,900	20,690,500	1,131,100	1,724,200	—	—	560	860	24,019	2,002
Grand total,	B.	\$65,406,500	\$66,257,000	\$5,450,600	\$5,521,400	100.00	100.00	\$790	\$800	\$2,823	6,902